

## REMARKS

This is a full and complete reply to the Office Action of April 5, 2005. Claim 16 has been cancelled. Claims 1-15, 17-20 remain as filed.

### Rejection under 37 CFR §1.75 (c)

Claim 16 is rejected for being of improper dependent form for failing to further limit the subject matter of a previous claim. Please cancel claim 16.

Claim 16 has now been deleted, therefore this rejection is now moot.

### Rejection under 35 U.S.C. §102(b)

Claims 1-8, 10, 11, 14, and 17-20 were rejected as being anticipated under 35 U.S.C. 102(b), as detailed below.

(1) Claims 1, 3, 5-7 and 17 are rejected as anticipated by US Patent No. 3,331,118 to Sinex ("Sinex"). The Examiner states that the spaced tubular conduits (19, 21) of Sinex form barriers extending below the freeboard, as claimed. The Examiner further states that desanding would inherently occur with water removal, as sand is heavier than water.

(2) Claims 1-4, 6-8, 10, 11, 14 and 17-20 are rejected as anticipated by US Patent No. 6,419,730 to Chavez ("Chavez"). The Examiner states that Chavez discloses a cylindrical vessel having an offset, eccentric inlet into a freeboard, plate type flow barriers (35, 37), and a collection area with a cleanout port (56), as claimed.

Applicant does not agree that Sinex or Chavez anticipate the claimed invention. Anticipation of a claim under §102(b) requires each and every element set forth in the claim be disclosed in a single prior art reference. *Davis v. Loesch*, 27 USPQ2d 1440 (Fed. Cir. 1993). Exclusion of a single claimed element from a prior art reference is enough to negate anticipation by that reference. *Atlas Power Co. v. E.I du Pont De Nemours & Co.* 224 USPQ 409, 411 (Fed. Cir. 1984). Both Sinex

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and Chavez fail to disclose all of the claimed elements and therefore do not anticipate Applicants' claims.

### Sinex

Sinex is absent a flow barrier, a belly portion below the lower edge of a flow barrier, and a flow barrier spaced from the fluid inlet so as to enable the fall trajectory of entrained particulates to intersect the belly portion. In short, Sinex is missing elements or has an arrangement in a manner inconsistent with the operation of Applicants' vessel.

In particular, Sinex does not disclose Applicants' flow barrier. The tubular conduits (19, 21) of Sinex not comparable to the claimed flow barrier, as asserted by the Examiner. Firstly, the line 19 and conduit 21 are not barriers to flow. Gas in the separator 22 is substantially unimpeded in its flow from the choke 11 to the sump 26 prior to the scrubber 28. The line 19 and conduit 21 are mere tubular conduits (fluid discharge pipes) extending downwardly from the top and through the separator to the various liquids 14, 15. Line 19 accesses the tank 18. Further, so that the intended function is fulfilled, Sinex's line 19 and tubular conduit 21 must protrude or extend below the gas liquid intersection or interface for fluid communication with the water 14 and oil 15, respectively. If the Examiner equates the liquids as being analogous to Applicants' belly portion, then the line 19 and tubular conduit 21 extend into the belly portion and do not direct fluid below as claimed by applicant.

Sinex is, for the most part, an oil and water separator. Oil and water separate into layer of oil 15 over water 14. The line 19 and conduits 21 recover water and oil respectively. The remaining gas must descend through conduit 25 through a liquid glycol sump 26. Particulates are not even contemplated at this stage. If, as asserted by the Examiner at page 3, paragraph 3, that particulates will settle inherently with water removal then particulates of any consequence would accumulate and block the sump 26 – ceasing operations. Any accumulation of particulates would be seen to either block the earlier liquid removal of oil and water,

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or the sump 26 through which gas is intended to pass. Particulates are only mentioned as an aside. As Sinex states at Col. 2, line 63, entrained particles are removed at scrubber 22 at the discharge of the separator 22. Sinex's scrubber extends across the entire separator. All of the gas must pass therethrough. The scrubber removes entrained particles and Sinex will only continue to operate if particulates are sparse and do not block the scrubber. When the scrubber fills with entrained particles, the scrubber will block all further gas flow therethrough. Operations would cease.

In contrast to the oil and water separation apparatus of Sinex, Applicants' claims are directed to particulate separation. Applicants' claimed flow barrier has a lower edge below which the fluid stream is directed and a belly is formed. In other words, Applicants' gas stream passes below the flow barrier, not around conduits as is the case in Sinex. Further, as result of Applicants' unique arrangement, as described in paragraph [0026], once the maximum depth of particles reaches the freeboard portion, Applicants' vessel continues to conduct fluids therethrough and operations may continue although desanding is no longer effective until such time as the belly portion is emptied of accumulated particulates. In contrast, Sinex does not provide apparatus capable of handling particulates without risk of blockage. Sinex's lines and tubular conduits 19,21 do not interfere with gas flow and ultimately protrude or extend into the belly portion without affecting the gas liquid intersection and thus do not achieve the purpose or effect of Applicants' flow barrier.

Accordingly, the rejection is unsupported by the art and should be withdrawn.

#### Chavez

Chavez is absent a belly portion below the lower edge of a flow barrier, and a flow barrier spaced from the fluid inlet so as to enable the fall trajectory of entrained particulates to intersect the belly portion. In short, Chavez is missing

elements or has an arrangement in a manner inconsistent with the operation of Applicants' vessel.

Chavez does not teach or contemplate particulates. At Col. 1, line 35 and at line 42, Chavez separates moisture from the flowing gas (I.42) and directs the moisture into the tank (I.35). In Chavez, the collection area corresponds to a tank (17) disposed below the vessel and which is in communication with the vessel through discharge openings (28, 31) formed in a bottom portion of the vessel. The baffles are positioned prior to the discharge openings and are oriented to downwardly direct water into the discharge openings and into the tank 17. If there were to be particulates, they would accumulate after the flow barrier in the apparatus of Chavez. Resulting water collected in the holding tank 17 is drained. The consequence of any entrained particulates is not disclosed. While liquids are being stored, they are deliberately spaced remote from the gas flow in a separate vessel and thus no belly portion can be formed for intersecting with the trajectory of any entrained particulates, if there were some. Accordingly, the baffles 35, 37 do not form a freeboard portion intersecting a belly portion and the arrangement of baffles does not permit a fall trajectory of the particles to intersect a belly portion prior to a flow barrier, as claimed by Applicants. Any entrained particulates will impinge the baffles with eventual destruction of the structure of the baffles.

As described in paragraph [0024], Applicant's arrangement avoids impingement-type erosion by the particulates on the internals of the vessel through the natural fall trajectory of the particulates before reaching a flow barrier. Further, the greater the length or spacing between the inlet and the flow barrier, the greater is the opportunity to drop and release entrained particulates (paragraph [0025]).

Chavez does not teach a spacing of a flow barrier from the fluid inlet so as to enable particulates to intersect a belly portion prior to the flow barrier.

Accordingly, the rejection is unsupported by the art and should be withdrawn.

**Rejection under 35 U.S.C §103(a)**

Claims 1-11, 14, and 17-20 are rejected under §103(a), as detailed below.

(1) Claims 17-20 are rejected as being obvious over Chavez (see above).

(2) Claims 1-11, 14, and 17-20 are rejected as being obvious over US Patent No. 6,783,683 to Collings ("Collings"). The Examiner states that Collings discloses a cylindrical vessel for removing particulates from a fluid comprising an eccentric offset inlet, a spaced outlet, and flow barriers in the form of both a plate (60) and a pipe (72), with risers forming cleanouts, as claimed. The Examiner further states that while the freeboard is not explicitly disclosed, it is submitted that the overflow weir plate (51) obviously creates a freeboard, which is below the inlet.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion or motivation to do so found in either the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 21 USPQ2d 1941 (Fed. Cir. 1992). Further, the fact that references can be combined or modified or that the claimed invention is well within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish *prima facie* obviousness. *In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990); *Ex parte Levengood*, 28 USPQ2d 1300 (BPAI 1993).

While the apparatus of Chavez functions to direct water into a water discharge opening positioned after the flow barrier, as discussed in the previous section, the claimed invention clearly requires that the particulates accumulate prior to the flow barrier. Based on the teachings of Chavez, there is no motivation for one skilled in the art to modify the apparatus of Chavez to produce the claimed invention. Chavez does not even contemplate the difficulties arising with particulates including impingement erosion and accumulation issues.

In particular, the claimed invention solves the problem of impingement-type erosion on the internals of the vessel by avoiding contact of particulates with

such internals, while the apparatus of Chavez is directed solely to achieving efficient separation of moisture in a gas flow (Col. 1, lines 42-43). Particulates in gas or in liquid are specific challenges addressed by designers, including consideration of erosion. Chavez has not addressed particulates. Chavez does not in any way contemplate a need to avoid erosive wear by particulates. Further, one skilled in the art would recognize that water does not produce erosive wear. Hence, a *prima facie* case of obviousness has not been established and this basis for rejection should be withdrawn.

Collings teaches a storm water separator. Normal operation finds water and entrained pollutants flowing entirely by gravity through the lower chamber 30, over a weir. There is only stagnant atmospheric gas or air over the liquid. With respect, Collings is a mere separator for pollutants already entrained in liquids. There is no fall of particulates to intersect a belly portion. There is no flow barrier forming a belly portion therebelow. Weir 50 sets a first liquid level and siphon weir 60 is immersed in the liquid flow. The fluid flow herein is in this liquid portion. The liquid is a continuous stream. There is no particulate fluid stream aside from those already contained in the liquids flowing through the chamber 30. If there were particulates, they would continue along the bypass pipe 86 and never have an opportunity to intersect with any analogous belly portion.

With respect to Collings, Applicant respectfully submits that the weir plate (50) does not create a freeboard, as claimed. As claimed, Applicants' freeboard is maintained by a flow barrier depending from the top of the vessel, with the freeboard being above the lower edge of the flow barrier. Applicant's fluid stream is in the freeboard. In contrast, the fluid stream of Collings is the accumulated liquid spilling over weir 50 and being siphoned out chamber 46. Collings's weir plate extends upwardly from the bottom of the vessel and functions as a physical barrier to collect sediment already in the fluid from flowing over the weir plate. The apparatus of Collings is completely different from the claimed invention in purpose and design and there is no motivation for one skilled in the art to modify the apparatus of Collings to produce the claimed invention. Further, even

if the apparatus was modified to depend from the top of the vessel, the weir plate would no longer be operable for its intended purpose as particulates would then be free to continue to the liquid exit 82. The inlet of Collings is not in multiple parts capable of flanged removal. The multiple part construction is mere connection of pipe sections to form a unitary pipe intake in multiple planes. There is no impetus for Collings to create a flanged nozzle do so as there is no need for a nozzle and no risk of erosion.

Hence, a *prima facie* case of obviousness has not been established and this basis for rejection should be withdrawn.

### CONCLUSION

It is believed that all of the Examiner's the objections have been addressed and reconsideration and allowance of claims 1-15, 17-20 is respectfully requested.

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Respectfully submitted,

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